FIG.1
PRIOR ART

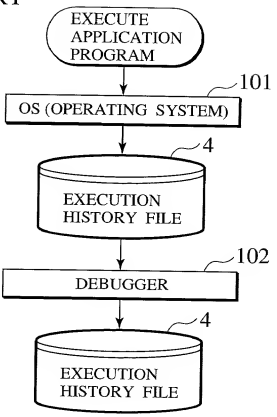


FIG.2
PRIOR ART

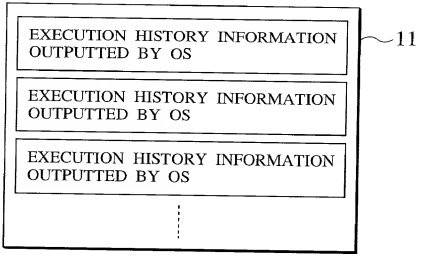


FIG.3A
PRIOR ART

type	oid	sysid	obj

FIG.3B
PRIOR ART

6	0	1		··· (i)
1	1	-9	2	··· (ii)
1	1	-9	3	··· (iii)
1	1	-17		··· (iv)
6	1	3		··· (v)
1	3	-19	1	··· (vi)
6	3	1		··· (vii)
	⋮			

WHERE
sysid : sta_txt ... -9
: ext_txt ... -10
: slp_txt ... -17
: wup_txt ... -19

FIG.4

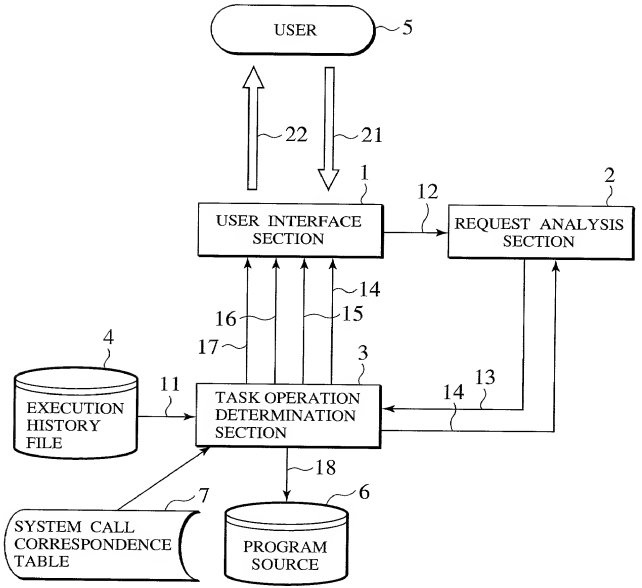

USER
5
22
21
1
12
2
USER INTERFACE SECTION
REQUEST ANALYSIS SECTION
14
16
15
17
3
4
11
13
14
EXECUTION HISTORY FILE
TASK OPERATION DETERMINATION SECTION
18
7
6
SYSTEM CALL CORRESPONDENCE TABLE
PROGRAM SOURCE

FIG.5

START
ST01
DISPLAY INFORMATION FROM TASK OPERATION DETERMINATION SECTION
ST04
HAS PROCESSING BEEN FINISHED?
YES
NO
ST05
IS THERE AN INPUT?
NO
YES
ST06
TRANSFER INPUTTED EVENT/ITEM INFORMATION TO REQUEST ANALYSIS SECTION 2
USER INTERFACE PROCESSING SECTION 1
ST07
ANALYZE REQUEST (OR GENERATE COMPARISON DATA FROM INPUTTED INFORMATION AND VERIFICATION DATA)
ST08
TRANSFER GENERATED COMPARISON DATA TO TASK INFORMATION DETERMINATION SECTION 3
REQUEST ANALYSIS SECTION 2
ST09
COMPARE COMPARISON DATA WITH VERIFICATION DATA, AND RETRIEVE STATE OF REQUEST TASK
ST10
ANALYZE CAUSE
ST11
UPDATE AND TRANSFER VERIFICATION DATA TO USER INTERFACE SECTION 1
ST12
GENERATE AND TRANSFER DETERMINATION RESULT DATA 1, 2 TO USER INTERFACE SECTION 1
ST13
DOES CAUSE OF DEFECT REMAIN UNSOLVED ?
NO
YES
ST14
GENERATE AND TRANSFER DEFECT SOLUTION QUESTION DATA TO USER INTERFACE SECTION 1
ST15
IS PROCESSING TO BE FINISHED ?
NO
YES
ST16
GENERATE NORMAL APPLICATION PROGRAM SKELETON
TASK OPERATION DETERMINATION SECTION 3
END

FIG.6

ORDER OF EVENTS	EVENT ATTRIBUTE (ISSUANCE OF SYSTEM CALL)	ISSUED SYSTEM CALL	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY
ORDER OF EVENTS	EVENT ATTRIBUTE (DISPATCH)	DISPATCH ORIGINATION TASK ID	DISPATCH ORIGINATION TASK PRIORITY	DISPATCH DESTINATION TASK ID
ORDER OF EVENTS	EVENT ATTRIBUTE (INTERRUPTION PROCESSING)	HANDLER ATTRIBUTE (CYCLE START HANDLER, ALARM HANDLER, INTERRUPTION HANDLER)	HANDLER NO.	—
⋮	⋮	⋮	⋮	⋮

TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
DISPATCH DESTINATION PRIORITY	—	—	—
—	—	—	—
⋮	⋮	⋮	⋮

EVENT ATTRIBUTE : ISSUANCE OF SYSTEM CALL
DISPATCH INTERRUPTION PROCESSING
HANDLER ATTRIBUTE : CYCLE START HANDLER
ALARM HANDLER
INTERRUPTION HANDLER

FIG.7

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
	⋮	⋮	⋮

TIMING (X)

FIG.8

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK
⋮	⋮	⋮
⋮	⋮	⋮

FIG.9

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk
⋮	⋮	⋮
⋮	⋮	⋮

FIG.10

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE
⋮	⋮	⋮
⋮	⋮	⋮

FIG.11

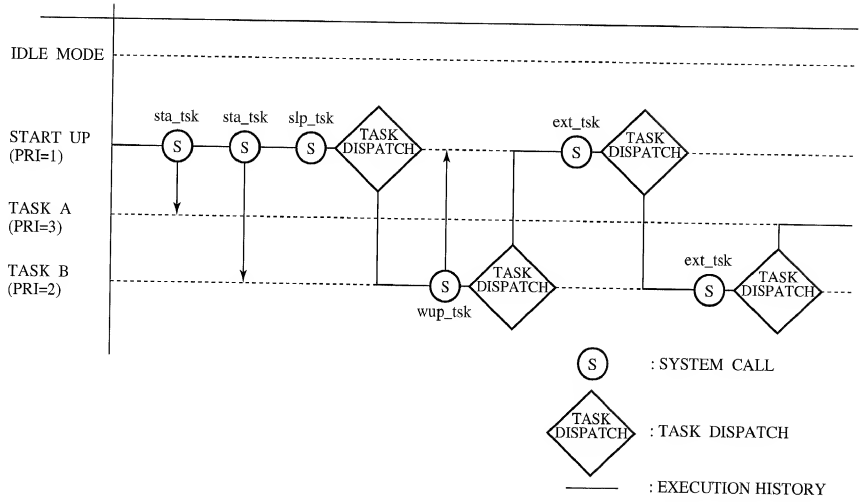

IDLE MODE
START UP
(PRI=1)
TASK A
(PRI=3)
TASK B
(PRI=2)
sta_tsk
sta_tsk
slp_tsk
TASK DISPATCH
ext_tsk
TASK DISPATCH
wup_tsk
TASK DISPATCH
ext_tsk
TASK DISPATCH
S
: SYSTEM CALL
TASK DISPATCH
: TASK DISPATCH
: EXECUTION HISTORY

FIG.12

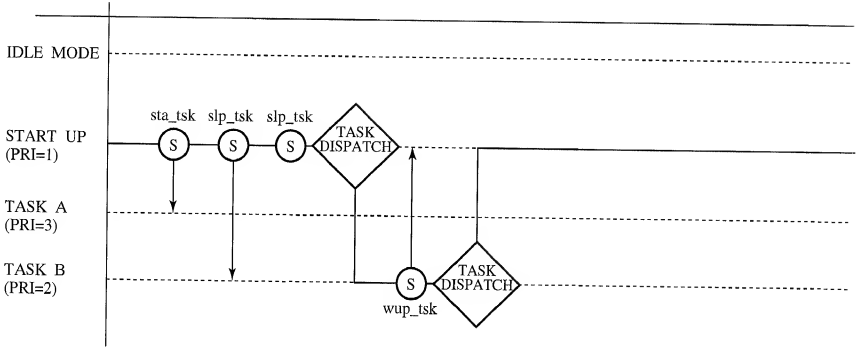

IDLE MODE
START UP
(PRI=1)
TASK A
(PRI=3)
TASK B
(PRI=2)
sta_tsk
slp_tsk
slp_tsk
S
S
S
TASK
DISPATCH
S
wup_tsk
TASK
DISPATCH

FIG.13

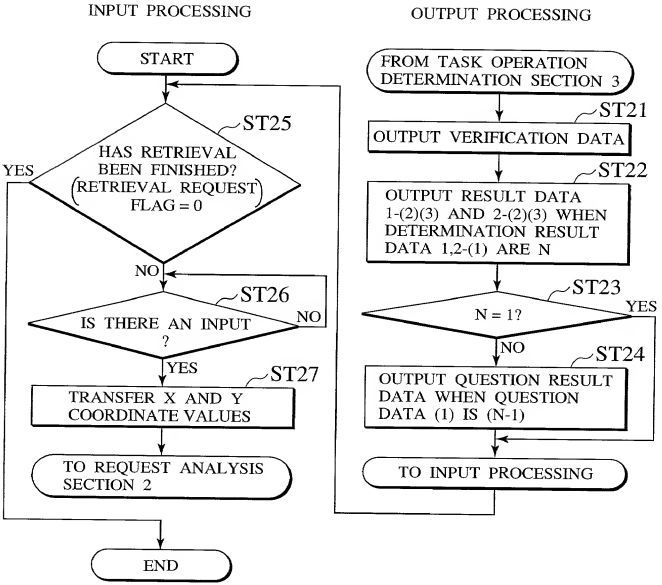
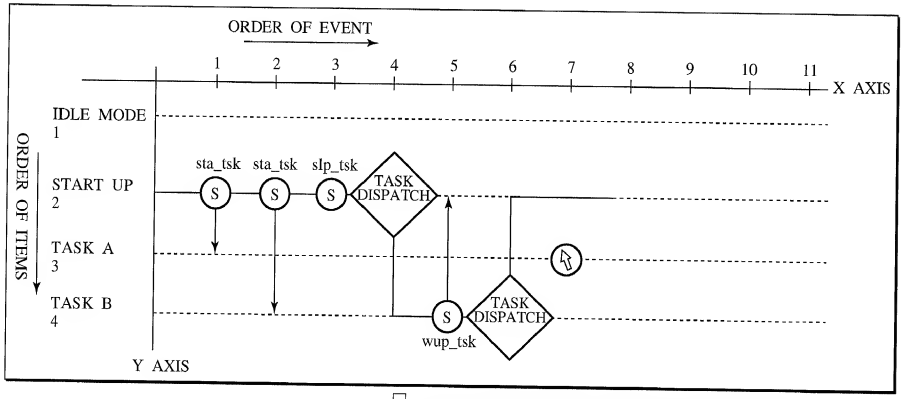

INPUT PROCESSING
OUTPUT PROCESSING
START
ST25
HAS RETRIEVAL BEEN FINISHED? (RETRIEVAL REQUEST FLAG = 0)
YES
NO
ST26
IS THERE AN INPUT ?
NO
YES
ST27
TRANSFER X AND Y COORDINATE VALUES
TO REQUEST ANALYSIS SECTION 2
END
FROM TASK OPERATION DETERMINATION SECTION 3
ST21
OUTPUT VERIFICATION DATA
ST22
OUTPUT RESULT DATA 1-(2)(3) AND 2-(2)(3) WHEN DETERMINATION RESULT DATA 1,2-(1) ARE N
ST23
N = 1?
YES
NO
ST24
OUTPUT QUESTION RESULT DATA WHEN QUESTION DATA (1) IS (N-1)
TO INPUT PROCESSING

FIG.14



INPUT CONDITIONS : ONLY LINE INDICATING EXECUTION HISTORY CAN BE DEFINED

: MOUSE CURSOR

MAKE MOUSE CURSOR CLOSER TO PLACE TO WHICH SYSTEM CALL IS TO BE ISSUED

X AXIS	7
Y AXIS	3

FIG.15

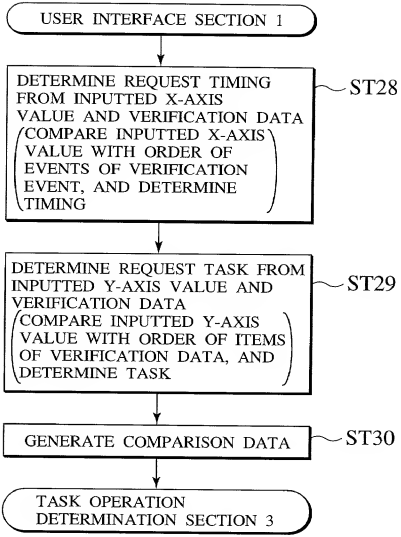
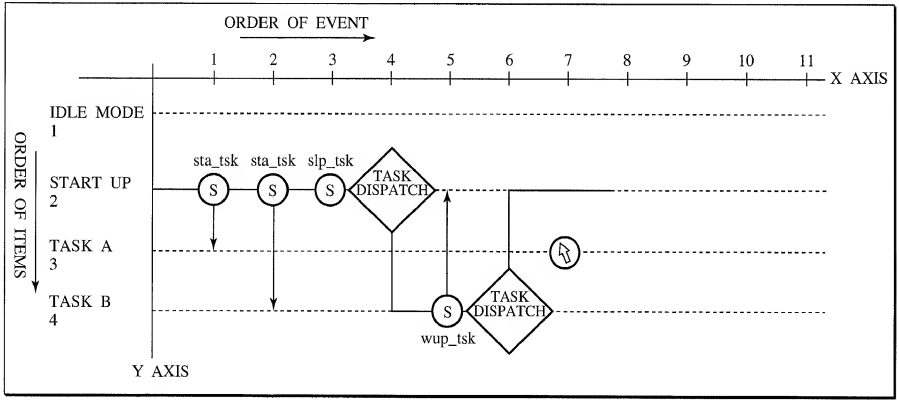

USER INTERFACE SECTION 1
DETERMINE REQUEST TIMING FROM INPUTTED X-AXIS VALUE AND VERIFICATION DATA (COMPARE INPUTTED X-AXIS VALUE WITH ORDER OF EVENTS OF VERIFICATION EVENT, AND DETERMINE TIMING
ST28
DETERMINE REQUEST TASK FROM INPUTTED Y-AXIS VALUE AND VERIFICATION DATA (COMPARE INPUTTED Y-AXIS VALUE WITH ORDER OF ITEMS OF VERIFICATION DATA, AND DETERMINE TASK
ST29
GENERATE COMPARISON DATA
ST30
TASK OPERATION DETERMINATION SECTION 3

FIG.16



IF MOUSE CURSOR IS MADE CLOSER TO PLACE TO WHICH SYSTEM CALL IS TO BE ISSUED

(FIRST INPUT)

X AXIS	7
Y AXIS	3

COMPARISON DATA

1	7	7	TASK A

REQUEST TIMING REQUEST TASK

FIG.17

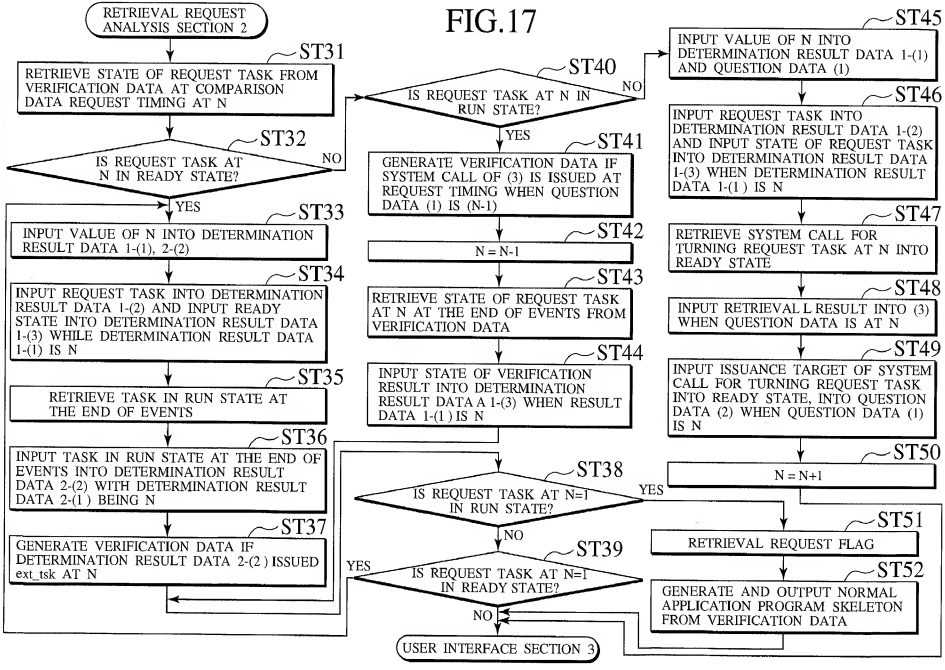

RETRIEVAL REQUEST ANALYSIS SECTION 2
ST31
RETRIEVE STATE OF REQUEST TASK FROM VERIFICATION DATA AT COMPARISON DATA REQUEST TIMING AT N
ST32
IS REQUEST TASK AT N IN READY STATE?
NO
YES
ST33
INPUT VALUE OF N INTO DETERMINATION RESULT DATA 1-(1), 2-(2)
ST34
INPUT REQUEST TASK INTO DETERMINATION RESULT DATA 1-(2) AND INPUT READY STATE INTO DETERMINATION RESULT DATA 1-(3) WHILE DETERMINATION RESULT DATA 1-(1) IS N
ST35
RETRIEVE TASK IN RUN STATE AT THE END OF EVENTS
ST36
INPUT TASK IN RUN STATE AT THE END OF EVENTS INTO DETERMINATION RESULT DATA 2-(2) WITH DETERMINATION RESULT DATA 2-(1) BEING N
ST37
GENERATE VERIFICATION DATA IF DETERMINATION RESULT DATA 2-(2) ISSUED ext_tsk AT N
ST40
IS REQUEST TASK AT N IN RUN STATE?
NO
YES
ST41
GENERATE VERIFICATION DATA IF SYSTEM CALL OF (3) IS ISSUED AT REQUEST TIMING WHEN QUESTION DATA (1) IS (N-1)
ST42
N = N-1
ST43
RETRIEVE STATE OF REQUEST TASK AT N AT THE END OF EVENTS FROM VERIFICATION DATA
ST44
INPUT STATE OF VERIFICATION RESULT INTO DETERMINATION RESULT DATA A 1-(3) WHEN RESULT DATA 1-(1) IS N
ST38
IS REQUEST TASK AT N=1 IN RUN STATE?
YES
NO
ST39
IS REQUEST TASK AT N=1 IN READY STATE?
YES
NO
USER INTERFACE SECTION 3
ST45
INPUT VALUE OF N INTO DETERMINATION RESULT DATA 1-(1) AND QUESTION DATA (1)
ST46
INPUT REQUEST TASK INTO DETERMINATION RESULT DATA 1-(2) AND INPUT STATE OF REQUEST TASK INTO DETERMINATION RESULT DATA 1-(3) WHEN DETERMINATION RESULT DATA 1-(1) IS N
ST47
RETRIEVE SYSTEM CALL FOR TURNING REQUEST TASK AT N INTO READY STATE
ST48
INPUT RETRIEVAL L RESULT INTO (3) WHEN QUESTION DATA IS AT N
ST49
INPUT ISSUANCE TARGET OF SYSTEM CALL FOR TURNING REQUEST TASK INTO READY STATE, INTO QUESTION DATA (2) WHEN QUESTION DATA (1) IS N
ST50
N = N+1
ST51
RETRIEVAL REQUEST FLAG
ST52
GENERATE AND OUTPUT NORMAL APPLICATION PROGRAM SKELETON FROM VERIFICATION DATA

FIG.18

〈SYSTEM CALL CORRESPONDENCE TABLE〉

NO	SYSTEM CALL	CORRESPONDING SYSTEM CALL
1	sta_tsk	ext_tsk
2	slp_tsk	wup_tsk
3	wai_sem	sig_sem
⋮	⋮	⋮

FIG.19

●[PROCESSING 1]→[FIRST REQUEST]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION /RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	3	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	slp_tsk	—	—	START UP	1	WAITING	—	—	—
4	TASK DISPATCH	—	—	—	START UP	1	—	TASK B	2	RUNNING
5	SYSTEM CALL	wup_tsk	—	—	TASK B	2	READY	START UP	1	READY
6	TASK DISPATCH	—	—	—	TASK B	2	—	START UP	1	RUNNING

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
1	7	7	TASK A

★

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.20

●[PROCESSING 2]→[PROCESSING COMPLETED]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	ISSUANCE ORIGINATION TASK	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION /RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	ISSUANCE DESTINATION TASK	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK	
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	3	READY			
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY			
3	SYSTEM CALL	slp_tsk	—	—	START UP	1	WAITING	—	—	—			
4	TASK DISPATCH	—	—	—	START UP	1	—	TASK B	2	RUNNING			
5	SYSTEM CALL	wup_tsk	—	—	TASK B	2	RUNNING	START UP	I	READY			
6	TASK DISPATCH	—	—	—	TASK B	2	—	START UP	1	RUNNING			
7	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—	★		
8	TASK DISPATCH	—	—	—	START UP	1	—	TASK B	2	RUNNING	★		
9	SYSTEM CALL	ext_tsk	—	—	TASK B	2	DORMANT	—	—	—	★		
10	TASK DISPATCH	—	—	—	TASK B	2	—	TASK A	3	RUNNING	★		

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
I	7	7	TASK A

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
I	TASK A	READY	★
I	TASK A	READY	★

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk	
I	START UP	ext_tsk	★
1	TASK B	ext_tsk	★

FIG.21

```
/*************************************************
     File          : sample.c
     Data          : 1999/11/11
     Developer : TOSHIBA
     Application  Skeleton
*************************************************/
#include''itron.h''

#define  TASK_ID1        1
#define  TASK_ID2        2
#define  TASK_ID3        3

TASK  startup() :
TASK  TaskA() :
TASK  TaskB() :


TASK  startup() :
{
        ER  ercd ;

          ercd = sta_tsk(TASK_ID2,0) ;
          ercd = sta_tsk(TASK_ID3,0) ;
          ercd = slp_tsk() ;

          ext_tsk() ; ---------------------------------------- (a)
}

TASK  TaskA()
{

          for( ; : ){
          }

}

TASK  TaskB()
{
          ER  ercd ;

            ercd = wup_tsk(TASK_ID1) ;

            ext_tsk() ; ---------------------------------------- (b)
}
```

FIG.22

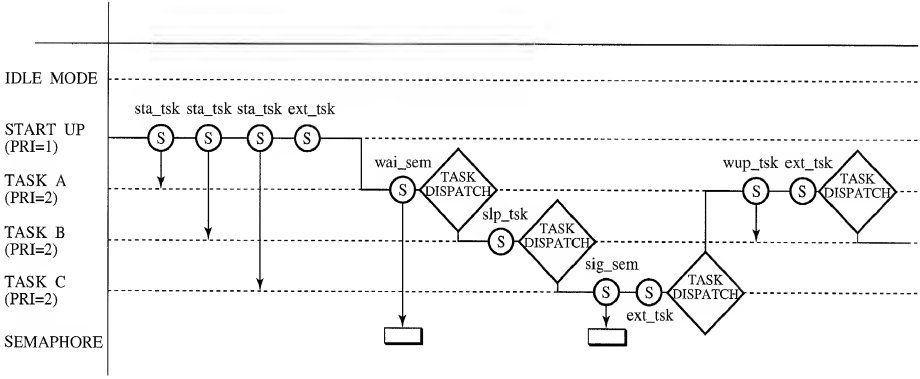

IDLE MODE
START UP
(PRI=1)
TASK A
(PRI=2)
TASK B
(PRI=2)
TASK C
(PRI=2)
SEMAPHORE
sta_tsk sta_tsk sta_tsk ext_tsk
S
wai_sem
TASK
DISPATCH
slp_tsk
sig_sem
ext_tsk
wup_tsk ext_tsk

FIG.23

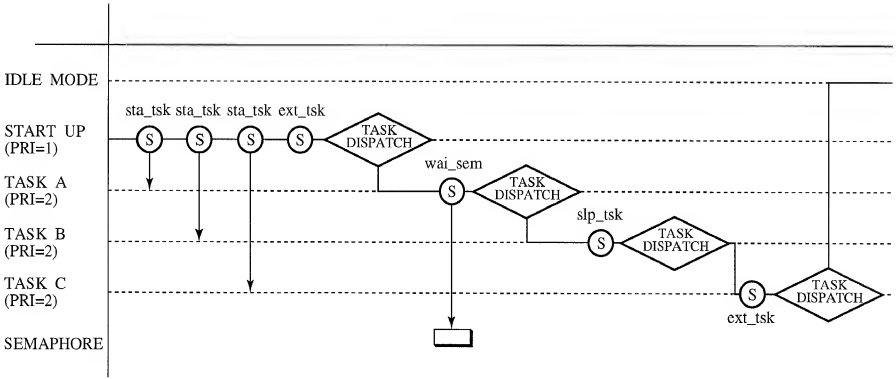

IDLE MODE
START UP
(PRI=1)
TASK A
(PRI=2)
TASK B
(PRI=2)
TASK C
(PRI=2)
SEMAPHORE
sta_tsk
sta_tsk
sta_tsk
ext_tsk
S
TASK
DISPATCH
wai_sem
slp_tsk
ext_tsk

FIG.24

●[PROCESSING 1]→[FIRST REQUEST]
〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	ISSUANCE ORIGINATION TASK	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION (RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY	
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY	
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY	
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—	
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING	
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—	
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING	
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—	
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING	
10	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—	
11	TASK DISPATCH	—	—	—	TASK C	2	—	IDLE MODE	—	—	

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
1	12	12	TASK B ★

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.25

●[PROCESSING 1]→[SECOND REQUEST]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION (RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING
10	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—
11	TASK DISPATCH	—	—	—	TASK C	2	—	IDLE MODE	—	—

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))	
1	12	12	TASK B	
2	6	7	TASK A	★

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE	
1	TASK A	wup_tsk	★

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK B	WAITING	★

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.26

●[PROCESSING 3]→[THIRD REQUEST]

〈VERIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION (RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	—	RUNNING
10	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—
11	TASK DISPATCH	—	—	—	TASK C	2	—	IDLE MODE	—	—

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))	
1	12	12	TASK B	
2	6	7	TASK A	
3	9	10	TASK C	★

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE	
1	TASK A	wup_tsk	
2	TASK C	sig_sem	★

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK B	WAITING	
2	TASK A	WAITING	★

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.27

●[PROCESSING 3]→[THIRD REQUEST]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION (RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING
10	SYSTEM CALL	sig_sem	—	—	TASK C	2	RUNNING	SEMAPHORE	1	— ★
11	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—
12	TASK DISPATCH	—	—	—	TASK C	2	—	TASK A	2	RUNNING

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))	
1	12	12	TASK B	
2	6	7	TASK A	★
3	9	10	TASK C	

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE	
1	TASK A	wup_tsk	★
2	TASK C	sig_sem	

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK B	WAITING	
2	TASK A	RUNNING	★

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.28

●[PROCESSING 5]→[FIFTH REQUEST]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION (RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING
10	SYSTEM CALL	sig_sem	—	—	TASK C	2	RUNNING	SEMAPHORE	1	—
11	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—
12	TASK DISPATCH	—	—	—	TASK C	2	—	TASK A	2	RUNNING
13	SYSTEM CALL	wup_tsk	—	—	TASK A	2	RUNNING	TASK B	2	READY ★
14	SYSTEM CALL	ext_tsk	—	—	TASK A	2	DORMANT			
15	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))	
1	12	12	TASK B	
2	6	7	TASK A	
3	9	10	TASK C	
1	13	13	TASK B	★
2	11	12	TASK A	

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE
1	TASK A	wup_tsk
2	TASK C	sig_sem

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK B	RUNNING	★
2	TASK A	RUNNING	

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk	
1	TASK A	ext_tsk	★

FIG.29

●[PROCESSING 6]→[PROCESSING COMPLETED]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	ISSUANCE ORIGINATION TASK STATE AFTER ISSUING ISSUANCE	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION (RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION) ID	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK	
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY	
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY	
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY	
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—	
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING	
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—	
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING	
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—	
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING	
10	SYSTEM CALL	sig_sem	—	—	TASK C	2	RUNNING	SEMAPHORE	1	—	
11	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—	
12	TASK DISPATCH	—	—	—	TASK C	2	—	TASK A	2	RUNNING	
13	SYSTEM CALL	wup_tsk	—	—	TASK A	2	RUNNING	TASK B	2	READY	
14	SYSTEM CALL	ext_tsk	—	—	TASK A	2	DORMANT				★
15	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING	★

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
1	12	12	TASK B
2	6	7	TASK A
3	9	10	TASK C
1	13	13	TASK B
2	6	7	TASK A

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE
1	TASK A	wup_tsk
2	TASK C	sig_sem

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK B	READY	★
2	TASK A	RUNNING	

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk
1	TASK A	ext_tsk

FIG.30

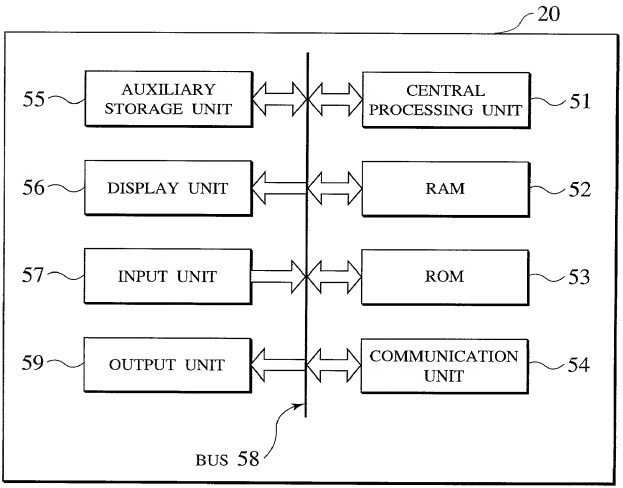

20
55
AUXILIARY STORAGE UNIT
CENTRAL PROCESSING UNIT
51
56
DISPLAY UNIT
RAM
52
57
INPUT UNIT
ROM
53
59
OUTPUT UNIT
COMMUNICATION UNIT
54
BUS 58

FIG.31

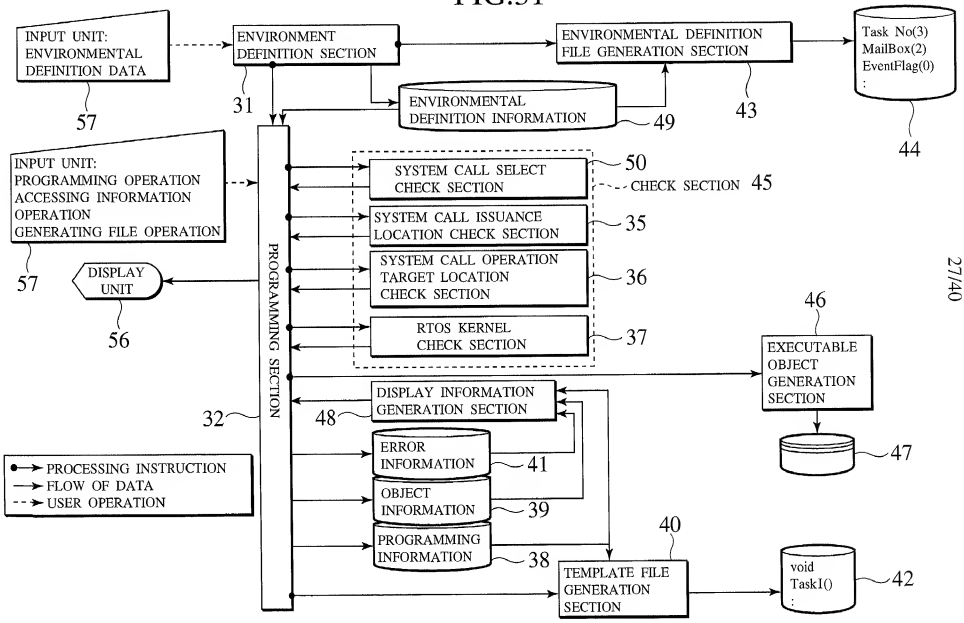

INPUT UNIT: ENVIRONMENTAL DEFINITION DATA
57
ENVIRONMENT DEFINITION SECTION
31
ENVIRONMENTAL DEFINITION FILE GENERATION SECTION
43
Task No(3)
MailBox(2)
EventFlag(0)
:
44
ENVIRONMENTAL DEFINITION INFORMATION
49
INPUT UNIT: PROGRAMMING OPERATION ACCESSING INFORMATION OPERATION GENERATING FILE OPERATION
57
DISPLAY UNIT
56
PROGRAMMING SECTION
SYSTEM CALL SELECT CHECK SECTION
50
CHECK SECTION 45
SYSTEM CALL ISSUANCE LOCATION CHECK SECTION
35
SYSTEM CALL OPERATION TARGET LOCATION CHECK SECTION
36
RTOS KERNEL CHECK SECTION
37
46
EXECUTABLE OBJECT GENERATION SECTION
47
DISPLAY INFORMATION GENERATION SECTION
48
32
ERROR INFORMATION
41
OBJECT INFORMATION
39
PROGRAMMING INFORMATION
38
40
TEMPLATE FILE GENERATION SECTION
void TaskI()
:
42
PROCESSING INSTRUCTION
FLOW OF DATA
USER OPERATION

FIG.32

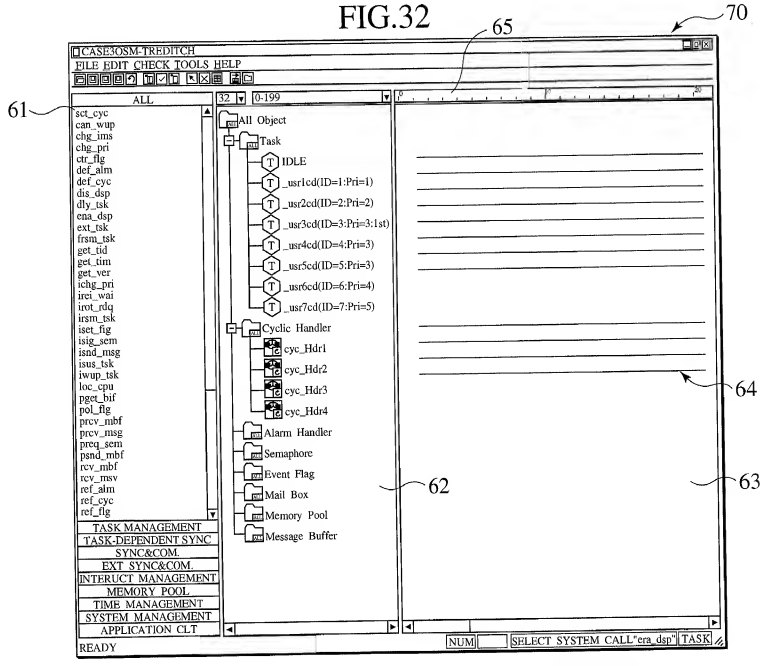

70
65
61
CASE3OSM-TREDITCH
FILE EDIT CHECK TOOLS HELP
ALL
32
0-199
sct_cyc
can_wup
chg_ims
chg_pri
ctr_flg
def_alm
def_cyc
dis_dsp
dly_tsk
ena_dsp
ext_tsk
frsm_tsk
get_tid
get_tim
get_ver
ichg_pri
irei_wai
irot_rdq
irsm_tsk
iset_flg
isig_sem
isnd_msg
isus_tsk
iwup_tsk
loc_cpu
pget_bif
pol_flg
prcv_mbf
prcv_msg
preq_sem
psnd_mbf
rcv_mbf
rcv_msv
ref_alm
ref_cyc
ref_flg
TASK MANAGEMENT
TASK-DEPENDENT SYNC
SYNC&COM.
EXT SYNC&COM.
INTERUCT MANAGEMENT
MEMORY POOL
TIME MANAGEMENT
SYSTEM MANAGEMENT
APPLICATION CLT
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
Alarm Handler
Semaphore
Event Flag
Mail Box
Memory Pool
Message Buffer
64
62
63
READY
NUM
SELECT SYSTEM CALL"era_dsp"
TASK

FIG.33

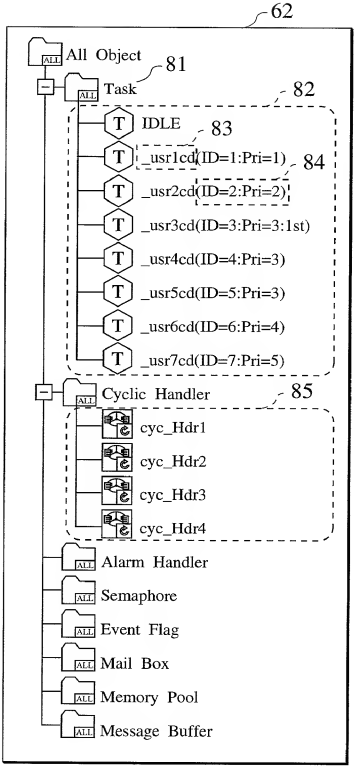

62
All Object
81
Task
82
IDLE
83
_usr1cd(ID=1:Pri=1)
84
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
85
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
Alarm Handler
Semaphore
Event Flag
Mail Box
Memory Pool
Message Buffer

FIG.34

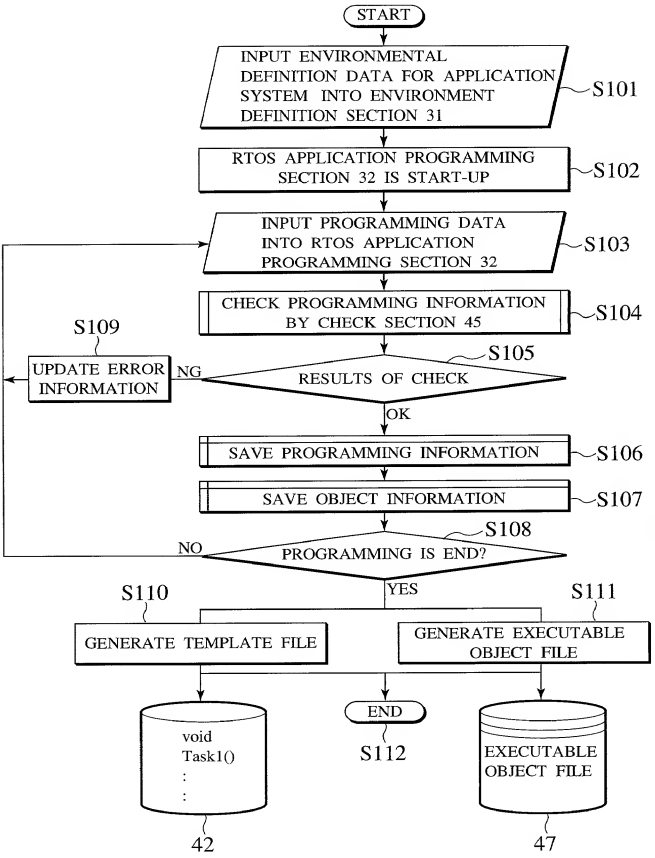

START
INPUT ENVIRONMENTAL DEFINITION DATA FOR APPLICATION SYSTEM INTO ENVIRONMENT DEFINITION SECTION 31
S101
RTOS APPLICATION PROGRAMMING SECTION 32 IS START-UP
S102
INPUT PROGRAMMING DATA INTO RTOS APPLICATION PROGRAMMING SECTION 32
S103
CHECK PROGRAMMING INFORMATION BY CHECK SECTION 45
S104
S105
RESULTS OF CHECK
NG
S109
UPDATE ERROR INFORMATION
OK
SAVE PROGRAMMING INFORMATION
S106
SAVE OBJECT INFORMATION
S107
S108
PROGRAMMING IS END?
NO
YES
S110
GENERATE TEMPLATE FILE
S111
GENERATE EXECUTABLE OBJECT FILE
void Task1()
:
:
42
END
S112
EXECUTABLE OBJECT FILE
47

FIG.35

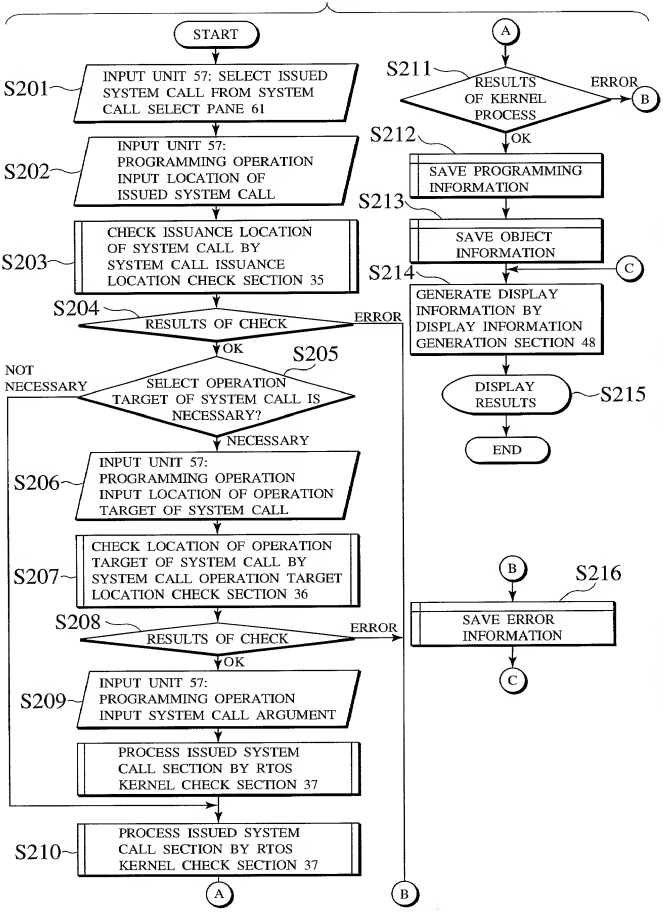

START
S201
INPUT UNIT 57: SELECT ISSUED SYSTEM CALL FROM SYSTEM CALL SELECT PANE 61
S202
INPUT UNIT 57: PROGRAMMING OPERATION INPUT LOCATION OF ISSUED SYSTEM CALL
S203
CHECK ISSUANCE LOCATION OF SYSTEM CALL BY SYSTEM CALL ISSUANCE LOCATION CHECK SECTION 35
S204
RESULTS OF CHECK
ERROR
OK
S205
SELECT OPERATION TARGET OF SYSTEM CALL IS NECESSARY?
NOT NECESSARY
NECESSARY
S206
INPUT UNIT 57: PROGRAMMING OPERATION INPUT LOCATION OF OPERATION TARGET OF SYSTEM CALL
S207
CHECK LOCATION OF OPERATION TARGET OF SYSTEM CALL BY SYSTEM CALL OPERATION TARGET LOCATION CHECK SECTION 36
S208
RESULTS OF CHECK
ERROR
OK
S209
INPUT UNIT 57: PROGRAMMING OPERATION INPUT SYSTEM CALL ARGUMENT
PROCESS ISSUED SYSTEM CALL SECTION BY RTOS KERNEL CHECK SECTION 37
S210
PROCESS ISSUED SYSTEM CALL SECTION BY RTOS KERNEL CHECK SECTION 37
A
B
A
S211
RESULTS OF KERNEL PROCESS
ERROR
B
OK
S212
SAVE PROGRAMMING INFORMATION
S213
SAVE OBJECT INFORMATION
C
S214
GENERATE DISPLAY INFORMATION BY DISPLAY INFORMATION GENERATION SECTION 48
DISPLAY RESULTS
S215
END
B
S216
SAVE ERROR INFORMATION
C

FIG.36

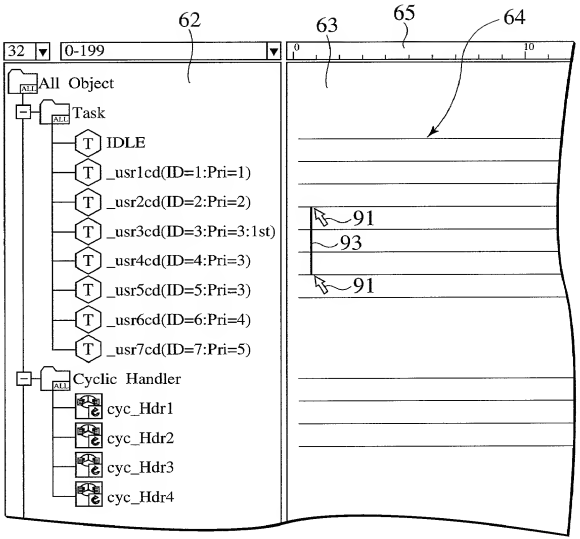

62
63
65
64
32
0-199
0
10
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
91
93
91

FIG.37

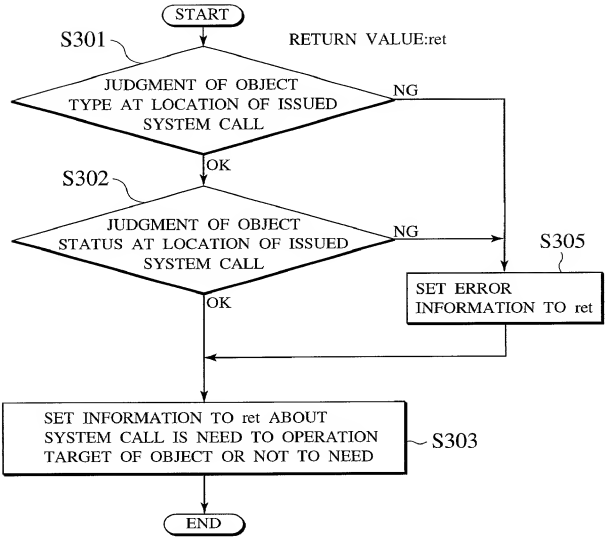

START
S301
RETURN VALUE:ret
JUDGMENT OF OBJECT TYPE AT LOCATION OF ISSUED SYSTEM CALL
NG
OK
S302
JUDGMENT OF OBJECT STATUS AT LOCATION OF ISSUED SYSTEM CALL
NG
S305
SET ERROR INFORMATION TO ret
OK
SET INFORMATION TO ret ABOUT SYSTEM CALL IS NEED TO OPERATION TARGET OF OBJECT OR NOT TO NEED
S303
END

FIG.38

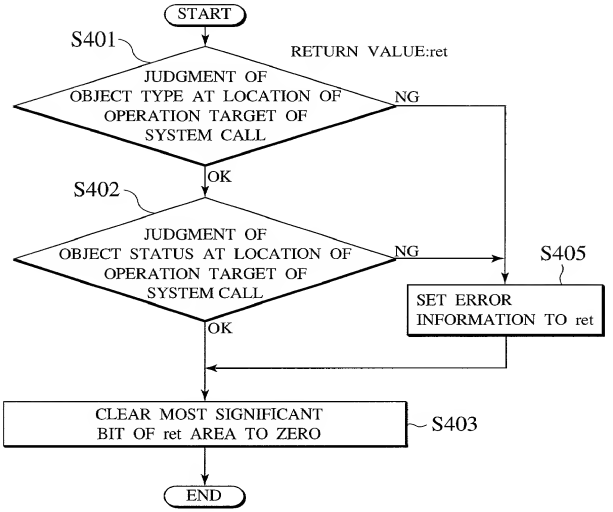

START
S401
RETURN VALUE:ret
JUDGMENT OF OBJECT TYPE AT LOCATION OF OPERATION TARGET OF SYSTEM CALL
NG
OK
S402
JUDGMENT OF OBJECT STATUS AT LOCATION OF OPERATION TARGET OF SYSTEM CALL
NG
S405
SET ERROR INFORMATION TO ret
OK
CLEAR MOST SIGNIFICANT BIT OF ret AREA TO ZERO
S403
END

FIG.39

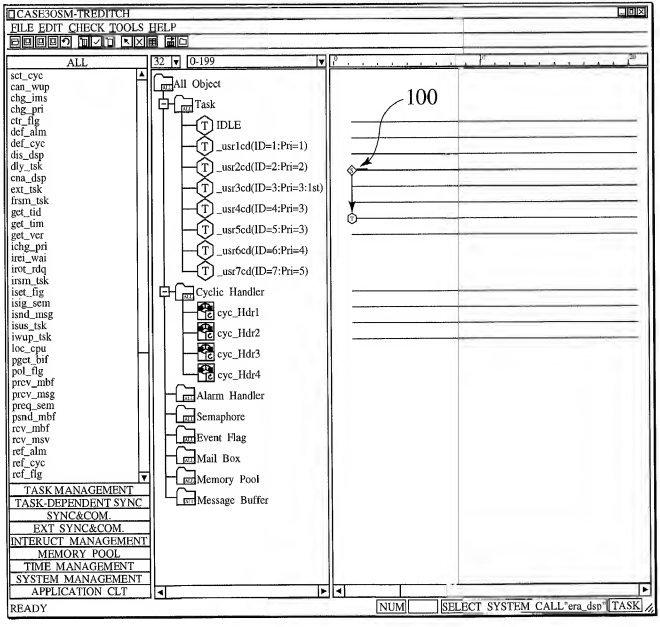

CASE3OSM-TREDITCH
FILE EDIT CHECK TOOLS HELP
ALL
sct_cyc
can_wup
chg_ims
chg_pri
ctr_flg
def_alm
def_cyc
dis_dsp
dly_tsk
ena_dsp
ext_tsk
frsm_tsk
get_tid
get_tim
get_ver
ichg_pri
iref_wai
irot_rdq
irsm_tsk
iset_flg
isig_sem
isnd_msg
isus_tsk
iwup_tsk
loc_cpu
pget_blf
pol_flg
prcv_mbf
prcv_msg
preq_sem
psnd_mbf
rcv_mbf
rcv_msv
ref_alm
ref_cyc
ref_flg
TASK MANAGEMENT
TASK-DEPENDENT SYNC
SYNC&COM
EXT SYNC&COM
INTERUCT MANAGEMENT
MEMORY POOL
TIME MANAGEMENT
SYSTEM MANAGEMENT
APPLICATION CLT
32
0-199
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
Alarm Handler
Semaphore
Event Flag
Mail Box
Memory Pool
Message Buffer
100
READY
NUM
SELECT SYSTEM_CALL"era_dsp"
TASK

FIG.40

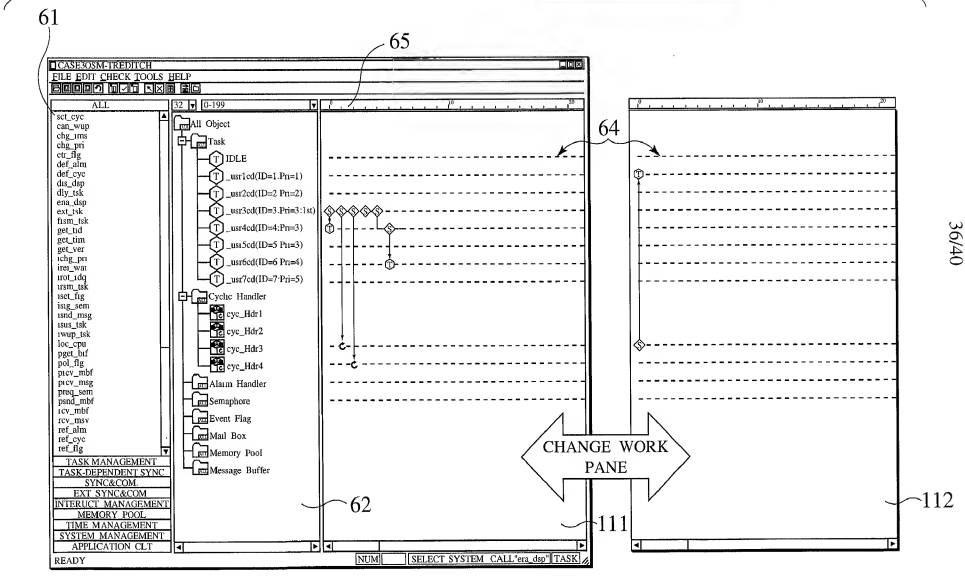

61
65
64
62
111
112
CHANGE WORK PANE
CASE'iOSM-TREDITCH
FILE EDIT CHECK TOOLS HELP
ALL
0-199
All Object
Task
IDLE
_usr1cd(ID=1,Pri=1)
_usr2cd(ID=2 Pri=2)
_usr3cd(ID=3,Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5 Pri=3)
_usr6cd(ID=6 Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
Alarm Handler
Semaphore
Event Flag
Mail Box
Memory Pool
Message Buffer
TASK MANAGEMENT
TASK-DEPENDENT SYNC
SYNC&COM
EXT SYNC&COM
INTERUCT MANAGEMENT
MEMORY POOL
TIME MANAGEMENT
SYSTEM MANAGEMENT
APPLICATION CLT
READY
NUM
SELECT SYSTEM CALL"era_dsp"[TASK]

FIG.41

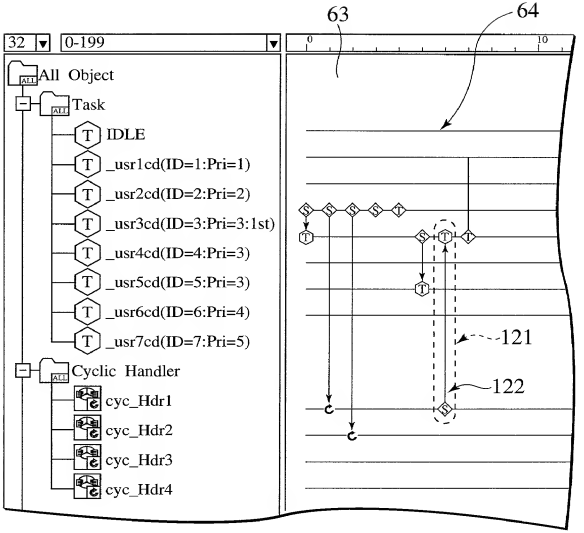

63
64
32
0-199
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
0
10
121
122

FIG.42

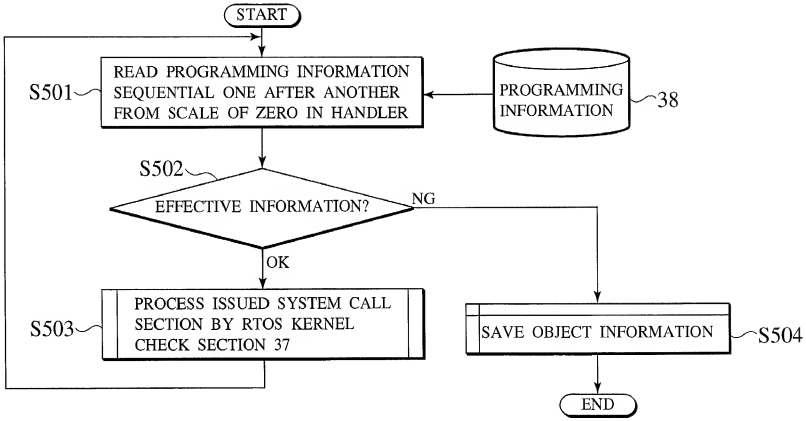

START
S501
READ PROGRAMMING INFORMATION SEQUENTIAL ONE AFTER ANOTHER FROM SCALE OF ZERO IN HANDLER
PROGRAMMING INFORMATION
38
S502
EFFECTIVE INFORMATION?
NG
OK
S503
PROCESS ISSUED SYSTEM CALL SECTION BY RTOS KERNEL CHECK SECTION 37
SAVE OBJECT INFORMATION
S504
END

FIG.43

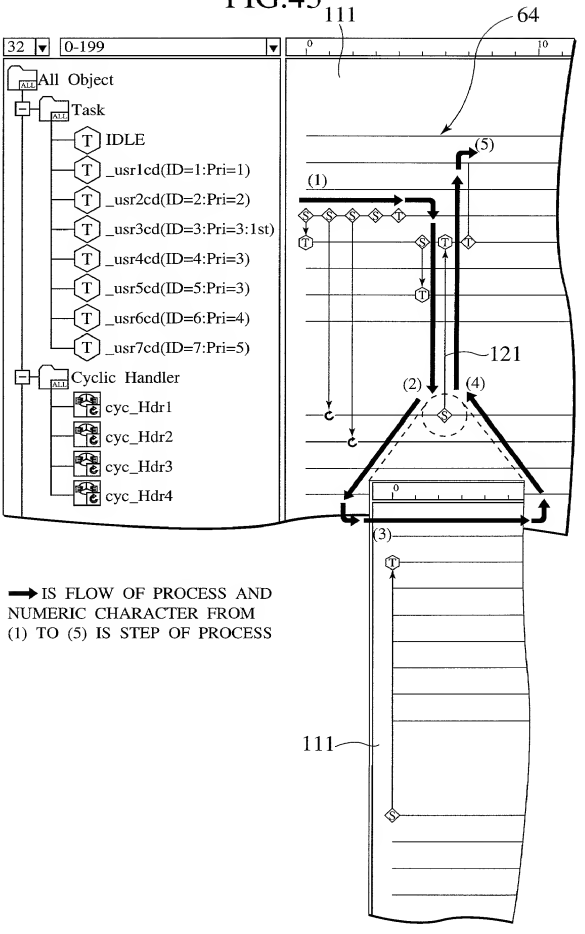
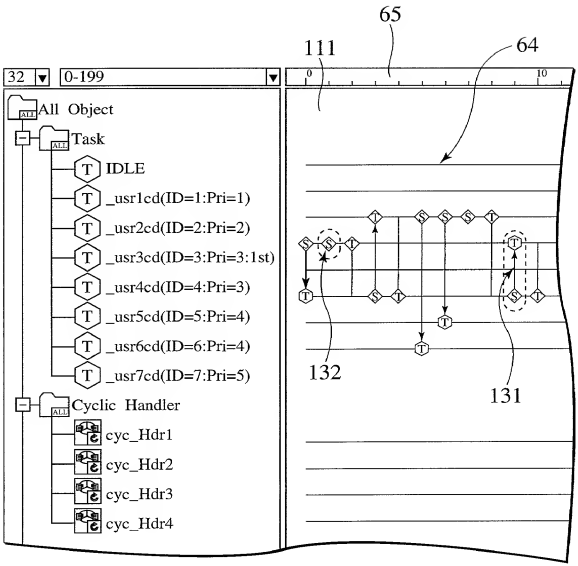

111
64
32
0-199
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
(1)
(2)
(3)
(4)
(5)
121
111
IS FLOW OF PROCESS AND NUMERIC CHARACTER FROM (1) TO (5) IS STEP OF PROCESS

FIG.44


65
111
64
32
0-199
0
10
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=4)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
132
131